

## **ATTACHMENT 1 FACILITY DESCRIPTION**

This section provides a general description of the U.S. Army Chemical Agent Munitions Disposal System (CAMDS) Activity at the Deseret Chemical Depot in Utah.

### **1.1 Introduction**

CAMDS has been in operation since 1979 conducting research, development, and demonstration of various methods of demilitarizing chemical munitions and treating the wastes resulting from demilitarization processes. The current CAMDS mission is to provide continuing process development and demonstration of integrated munitions demilitarization and waste treatment plants and processes.

#### **1.1.1 Generating New Information**

CAMDS operates as a Treatment, Storage, and Disposal Facility (TSDF) to demonstrate and refine baseline and alternative technologies. The general areas described are munitions handling and disassembly, incineration of wastes resulting from munitions handling, pollution abatement systems associated with incineration and munitions handling, and treatment of wastes such as scrap metal, brines, and ash to minimize the amount of waste requiring disposal. Information generated aids in the technical and economic feasibility evaluation of various munitions handling equipment, incinerators, pollution abatement systems, and alternative treatment methods. Documents at the facility will be maintained in the form of originals, permanent film, or optical media, all of which have been deemed legal in a court of law. Original "hard copies" of documents that have been filmed will be maintained in the Washington National Records Center (WNRC), Suitland, Maryland, in accordance with the requirements of AMC-R 385-131 and AR 25-400-2.

#### **1.1.2 Treatment in Non-Earthen Units and Devices**

CAMDS waste treatment units consist of fabricated equipment reflecting state-of-the-art technology.

#### **1.1.3 Quantity of Waste and Scale of Operation**

The units at CAMDS are sized to handle actual munitions at rates that demonstrate the processes involved. The equipment and process control technologies provide reliability data for demilitarization of chemical munitions, extended operations maintenance evaluation, incineration of actual munitions components and chemical agents, control of integrated processes, and treatment of flue gases and solid residues.

Legislation that significantly affects the waste management practices pertaining to the demilitarization of chemical munitions is Public Law 99-145 (Department of Defense Authorization Act, 1986), which directs the Secretary of Defense to destroy the stockpile of chemical weapons. The main objective at CAMDS is to support activities devoted to accomplishing this directive.

### **1.2 Operational Objectives**

In support of the national policy to safely and effectively dispose of chemical munitions, CAMDS is demonstrating baseline technologies and conducting developmental testing of proposed technologies for:

- Demilitarization of munitions, components, and residue
- Treatment of wastes resulting from demilitarization and other sources
- The goals are subject to change periodically as priorities change, or as technology is developed that promises to improve overall process performance, economics, or material handling safety. It is implicit in the definition of the goals that progress be made simultaneously in the following areas:
  - Demilitarization Machine Design
  - Demilitarization Operating Procedures
  - Demilitarization Process Monitoring
  - Work Environment Monitoring
  - Ambient Environment Monitoring
  - Waste Treatment Process Design
  - Incineration Design and Operation
  - Waste Treatment Process Evaluation
  - Waste Treatment Process Operating Procedures
  - New Technology Design and Operation

Specific goals that have been identified in support of the demilitarization program for chemical munitions are:

- Test, evaluate, and demonstrate the performance of demilitarization equipment such as mine demilitarization machines, multipurpose demilitarization machines, rocket/burster shear machines, projectile mortar disassembly machines, bulk drain equipment, and other machinery as it becomes available for use in managing chemical munitions.
- Test, evaluate, and demonstrate incinerators for use in treating hazardous waste arising from demilitarization of chemical munitions. This includes the Metal Parts Furnace (MPF), and any additions to the list as other methods of managing chemical munitions become available.
- Test, evaluate, and demonstrate the performance of pollution abatement components

to control emissions from the incinerators, and other technologies as deemed necessary.

- Test, evaluate, and demonstrate the performance of various processes for treating wastes resulting from demilitarization of chemical munitions. This includes the drying system for treating PAS brines, incineration of decontamination liquids, and detoxification of brines. Included is the testing of the LIC, DFS, MPF, and other furnaces or incinerators for treatment of spent decontamination solutions and other miscellaneous liquid and solid wastes. All of this must be accomplished with the goal of minimizing the amount of waste that will require management.
- Test and evaluate the monitoring systems for chemical agents, including Bubbler System, Automatic Continuous Air Monitoring System (ACAMS), Miniature Chemical Agent Monitor (MINICAMS) Depot Area Air Monitoring System (DAAMS), M43 monitoring systems, and other monitoring systems as they become available. CAMDS provides an environment for testing these systems similar to the one, which they will use in the CSDP.
- Test and evaluate new technology

Incinerator testing and operation may be divided into three categories: (1) startup and systemization; (2) environmental performance evaluation; and (3) disassembly machine or facility support. Operational performance data will be collected during all phases. Effluent and emissions characterization, above that which is normally required to operate the incinerators and pollution abatement systems, will only be performed during test burns conducted during environmental performance evaluation.

- Startup and Systemization occur when the incinerator and pollution abatement system are first started in support of a new chemical agent or munition. During this period, the agent or munition feed rate is gradually increased until the peak or design feed rate is obtained. This phase of operation typically lasts 4 to 6 weeks but can take longer if problems are experienced.
- Environmental Performance Evaluation involves conducting test burns to evaluate the performance of the incinerator and pollution abatement system against current and proposed regulatory standards. Environmental performance will be evaluated using simulants and actual chemical agents and munitions. Test burns will consist of baseline or background trial and agent/munition incineration trials at the maximum feed rate obtained during startup and systemization.
- Test Clean up, System Disassembly, and Facility Support will be accomplished by disassembly of equipment as needed for decontamination. Materials used in the test that became contaminated will be decontaminated to a 3X or 5X level for reuse or disposal. Facilities will be decontaminated to a 3X condition and made ready for future tests.

### 1.3

#### General Facility Description

CAMDS is located in the southwest quadrant of Deseret Chemical Depot. This depot area is located in the state of Utah, approximately 25 miles south of the Great Salt Lake.

CAMDS is composed of incinerators, munitions handling areas, waste handling areas, oil and chemical storage areas, hazardous waste storage areas, sample analysis areas, laboratories, control rooms, maintenance facilities, and support buildings. CAMDS operations area is enclosed by a double fence, and entry is strictly controlled through one gate. The depot area is also fenced, and entry into the depot area containing CAMDS is strictly controlled.

The facility normally operates 4 days per week, 10 hours per day. However, the operations vary from week to week, depending on schedules and priorities. Surveillance and control of entry to the facility is maintained around the clock by the depot area security force.

Inventories of munitions are maintained at levels necessary to support the plans and projects defined for a given period of time. As a project is completed, the wastes are collected and placed in storage awaiting further treatment at CAMDS or removed off-site for disposal. Characterization of treatment process wastes is a continuing effort during the course of a project.

The treatment processes are controlled by state-of-the-art programmable controllers with central data collection facilities.

Area workplace monitoring is provided within the CAMDS site by two types of monitors.

- High Level/Low Level Rapid Response, NRT monitors
- Background Historical Monitoring, DAAMS, Bubbler System, or equivalent

These monitoring systems are used for agent vapor detection when handling munitions, testing for agent before entering restricted work areas, monitoring stacks, and necessary work areas. Monitoring records are maintained as required. Perimeter monitoring, a network of eleven stations located within the depot area, provide a detailed record in the event of an agent release. These perimeter stations use DAAMS (or equivalent).

Emergency response procedures and contingency plans for dealing with releases of chemical agents have been developed by the Army and have continually been updated in the 70 years that the Army has managed chemical weapons. These procedures are sophisticated and training in their use is conducted regularly. In the 17 years of operation with chemical munitions at CAMDS, these emergency procedures have not failed and have protected human health and the environment.

CAMDS is owned and operated by the Department of the Army (DOA). The Office of the Program Manager for Chemical Demilitarization (PMCD) is responsible for direction and funding of CAMDS.

#### 1.4

##### Munition Processing Systems

A major step toward attaining the objectives for CAMDS is to establish an optimum-processing rate for each type of munition to be demilitarized. Demonstrating the

effectiveness of the demilitarization equipment and process systems requires that tests be conducted with real munitions under actual operating conditions. This method of testing provides meaningful performance data, verifies safety and operating procedures, and allows for a realistic evaluation of system availability. In addition, the operation of disassembly machines, furnaces, brine dryers, and material handling devices as an integrated system, develops a comprehensive data base of the following items:

- Process throughput capabilities
- Optimum operating range
- Process and work area-monitoring equipment
- System reliability and maintainability
- Pollution abatement systems

The process information obtained at CAMDS is used to confirm design and performance of equipment and processes for improvement of demilitarization facilities.

In general, the munition feed rates at CAMDS are sufficient to demonstrate the operability of the system or process, and provide relevant design and operating parameters for the Chemical Stockpile Disposal Program. It is important that extensive operating data be obtained on how these feed rates affect demilitarization processes. The experience gained from this program improves data reliability for designing new processes and identifies potential design problems.

Incineration is an established process for managing wastes resulting from demilitarization of chemical munitions. The development of an incinerator and processes requires that there be sufficient information to design an effective treatment system. There are inherent interactions in these designs between the chemical/physical properties of the waste to be treated and the mechanical limitations of the equipment available for treating wastes. CAMDS provides a test facility for investigating these process interactions by using actual munitions and chemical agent in a strictly controlled and monitored environment. The information developed is then used to improve facilities and equipment to safely and effectively manage the treatment and disposal of the existing chemical weapons stockpile and residues generated.

CAMDS tests are conducted at a level of operation so that significant process interactions can be identified and properly designed into other proposed facilities. This level of operation is necessary in order that design information is available for proper treatment and management of chemical munitions and residues generated.

## 1.5

### General Process Descriptions

CAMDS is designed to test equipment and methods for demilitarizing many different types of chemical munitions and treatment of related waste.

The methods to destroy various chemical munitions and related wastes include incineration of agents, incineration of residual agent contamination on metal parts and

inert munition components, and incineration of explosive components. CAMDS will use incineration as the primary method of agent destruction. After testing and demonstration, alternate technologies may be used as a secondary method of agent destruction.

In order to provide the flexibility required developing each process, CAMDS must provide numerous "subsystems" that can be used in whole or in part for each munition process. Many of these are used on a continuous basis with some used only for certain situations or process needs. These include, but are not limited to:

- Munitions Holding Area (MHA)
- Unpack Area(s)(UPA) and Loading Areas
- Blast containment operating areas [Explosive Containment Cubicle (ECC) Nos. 1 and 2]
- Incinerator (MPF)
- Pollution Abatement Systems (PAS)
- Ventilation system filters
- Brine Dryer Area (BDA)
- Multipurpose Demilitarization Facility (MDF)
- Bulk Item Facility (BIF)
- Equipment Test Facility (ETF)
- Toxic Maintenance Facility (TMF)
- Residual Storage Area (RSA)
- Ventilated Storage Area (VSA)
- General Purpose Facility (GPF)
- Material Treatment Facility (MTF)
- Auxiliary Test Facility / Residual Storage Facility (ATF/ RSF)
- Personnel support facilities
- Chemical laboratories: CAMDS Lab and Building 4541 Lab
- Air monitoring systems

#### 1.5.1 General process flows

To introduce the different processes used at CAMDS, general process flows for various items are provided below. These process flows illustrate the use of most of the CAMDS process equipment. Drawings, found in Attachment 11, show the CAMDS site layout, which identifies the various process locations.

##### 1.5.1.1 Projectiles/Mortars/Bursters/Rockets

All projectiles/mortars/bursters/rockets are inspected at the Area 10 igloo for evidence of chemical agent leakage prior to transfer to CAMDS. The non-leaking munitions on pallets are then transported to the MHA in a munition transport van. In the MHA, the munitions are again inspected for external evidence of agent leakage. Leaking or suspected contaminated munitions are overpacked and taken separately to the ETF ventilated vestibule for unpacking by personnel in protective clothing. Leaking munitions are processed after non-leaking munitions to minimize contamination in the ETF vestibule. Non-leaking munitions are taken from the MHA to the ETF UPA.

In the ETF UPA the munitions are inspected again to ensure that they do not leak. If the munitions are not contaminated, the propellant charge, cartridge case, and packing container are removed and returned to storage in Area 10.

The non-contaminated munitions are sent to ECC No. 2 for removal of the explosive and miscellaneous components (such as fuze or nose closure, supplementary charges, and bursters) by the Projectile Mortar Disassembly Machine (PMD). Leaking munitions are unpacked in the ventilated vestibule and also sent to ECC No. 2 for disassembly.

After removal of the explosive and miscellaneous components, non-leaking projectiles/munitions are moved from ECC No. 2 to the ETF Repack Area. Nose closures are installed on the projectiles in the vestibule and are then either repalletized or placed on containers for transport to the projectile line system at the Multipurpose Demilitarization Facility (MDF). Leakers are removed from the ECC in overpacks and may be moved directly to the MDF for processing or may be returned to interim storage.

Fuzes, bursters, and supplementary charges are transferred to the ETF Repack Area where they are packaged for movement to ECC No. 1. Bursters are sheared in the ECC No. 1 using the Rocket Shear Machine (RSM). Munitions and munition components are monitored using NRT monitors/DAAMS throughout the munition disassembly process.

The miscellaneous munition components are transferred to the MPF for incineration.

#### 1.5.1.2 Non-bursted Projectiles/Cartridges

Palletized and boxed munitions are taken from the Area 10 igloo to the MHA by the transport van. The projectiles are inspected for agent leakage at the igloo and again at the MHA. Leaking projectiles are segregated and externally decontaminated. The leaking projectiles are over packed and transported to the MDF where they are unpacked in a ventilated area and entered into the system for processing in the same manner as non contaminated projectiles. After unpacking, the projectiles are conveyed to the Multipurpose Demilitarization Machine (MDM) where the burster wells are removed from the projectile body by the MDM to provide access to the agent cavity.

#### 1.5.1.3 Bombs and Spray Tanks

Bombs and spray tanks (bulk items) are transported from the storage site to the MHA by truck. They are inspected for leakage in the storage area and again at the MHA prior to off-loading on pallets and transport by forklift. If a leaking item is discovered, it is externally decontaminated by personnel in protective clothing and immediately placed in the airlock of the MDF for processing. The bombs or tanks are placed, one at a time, on bulk item cradles and are conveyed to the Bulk Drain Station (BDS) in the BIF UPA for processing. At the BDS, the bomb or spray tank is punched and drained. The agent is pumped to agent holding tanks for incineration or to a Ton Container (TC) in the MDF for incineration or return to storage. The drained bulk item is then transferred by conveyor directly to the MPF for incineration. After incineration, the bomb or tank casing is transported to a storage area. Non-contaminated pallets are returned to the storage area for reuse.

#### 1.5.1.4 Ton Containers

TCs are transferred from the MHA to the MDF via forklift. They are conveyed to the BDS where they are punched and drained. They are then transferred to the MPF for thermal decontamination. Agent is drained to the MDM chemical agent holding tanks and later transferred to a furnace for incineration. The container and residual agent are decontaminated in the Metal Parts furnace.

If the agent is not to be incinerated, it will be loaded into serviceable TCs and returned to the depot stockpile. This could occur if an incinerator were not available to incinerate the agent, or if the processing machinery was not available, or during agent changeover and cleanup.

1.5.2 General Process Areas

1.5.2.1 Munition Holding Area

1.5.2.1.1 Purpose

The purpose of the MHA is to receive munitions into the CAMDS site for unloading, inspection, storage, and preparation for movement to an UPA or Loading Area. The Army's approved explosive limit for the MHA is 800 pounds of Class 1.1 material.

1.5.2.1.2 Description

The MHA consists of an L-shaped, 15-foot high, double-riveted earthen and steel barricade and a storage igloo measuring approximately 25 feet long, 13-feet wide, and 7-feet high (internal height). Munitions are transported to the MHA from storage locations in an ammunition van for CAMDS site in-process storage. Following inspection by the DCD Surveillance team, munitions may move directly to the UPA, MDF or other areas for processing. Drawings that show the locations and layouts of these units are in Attachment 11.

1.5.2.1.3 Operation

Munitions are delivered to the MHA from Area 10 storage in a van followed by a decontamination truck and are escorted by Security guards. Munitions are monitored for chemical agent leaks before and after transportation and while in storage at the MHA.

If an alarm sounds, or a leaker is detected, all personnel in/at the MHA mask up. Trained response team members, dressed in appropriate protective clothing, confirm the monitors and decontaminate the area and equipment as required.

Non-leaking munitions are moved into the MHA igloo for on-site storage or are transported to a UPA. Leaking munitions found at the MHA are handled according to approved methods.

Spills and surface contamination are washed and cleaned with appropriate decontamination solutions. The contaminated munitions are containerized in a sealed container. The sealed container is taken to a ventilated vestibule for processing. The sealed container provides secondary containment during transportation and temporary

storage of the munitions. A small amount of decontamination solution is maintained within the MHA igloo for environmental clean-up and/or personnel decontamination. If needed, more decontamination solution is available from the plant Chemical Distribution System (CDS).

#### 1.5.2.2 Unpack Area

##### 1.5.2.2.1 Purpose

The purpose of the UPA is to provide an area within CAMDS where items can be removed from their shipping and storage containers and be prepared for processing. The UPA houses a toxic vestibule, which provides personnel entry and exit to ECC No. 1.

The packing material is separated from the munition. Two air locks are provided and are used to introduce all leaking and potentially leaking munitions into the toxic vestibule. The UPA flooring is constructed of reinforced concrete and sealed with an epoxy formulation that is resistant to attack by chemical agent, decontamination solutions, and brines.

##### 1.5.2.2.2 Description

The UPA consists of several areas: an unpack area for unpacking and processing non-leaking munitions, an airlock and a toxic vestibule for processing potentially leaking munitions. The approved explosive limit for the UPA is 50 pounds of Class 1.1 material. Drawings that show the location and layout of these units are in Attachment 11.

Unpack Area for processing non-leaking munitions. This area consists of scrap containers, material handling equipment, an emergency shower, and ample working room for three operators to work in a safe manner. Two personnel doors equipped with shatterproof plastic windows and "panic bars" are provided, as is a munition access door, which is large enough to accommodate a forklift. This area is ventilated through carbon filters.

Airlock Areas. Included in this area are a fresh water shower and an undress area (doffing room), located near ECC No. 1 personnel door. When leaving the vestibule, the operators scrub their protective clothing with decontamination solution. The protective suit is rinsed to remove decontamination solution in the fresh water shower area. Agent detectors are provided for personnel monitoring to ensure that workers exiting the area are thoroughly decontaminated. After decontamination, the operators remove their overboots and gloves. They then proceed to the undress area to remove their protective clothing. An observation window is provided so support personnel can observe the entire airlock area. The ventilation system provides a negative pressure in the airlock area relative to uncontaminated areas.

Toxic vestibule for processing leaking munitions and potentially leaking munitions. The toxic vestibule area for downloading potentially leaking munitions is accessed via a double-door airlock. The munitions are placed on a conveyor for unpacking and then moved via the conveyor to the ECC No. 1 for further processing. Operators in the vestibule follow the same decontamination procedures outlined above.

1.5.2.2.3 Operation

Transfer of munitions from the MHA to the UPA is accomplished by forklift. The forklift operator, upon request from the UPA operator, enters the UPA with a palletized load of munitions and places the pallet near the input conveyor. The UPA operator does not begin to process the munitions until the forklift operator has completed his duties, the forklift has been removed, the munition access door has been closed, and approval has been received from the Control Module Operator (CMO) to proceed.

The UPA is continuously monitored by closed circuit television (CCTV). Communication with the operator is via headset-microphone. Observers also view the process through windows. Operations cease in the UPA if an alarm or upset condition exists. Red flashing warning lights are installed adjacent to each entrance door and are activated to indicate an upset condition or conditions requiring protective clothing.

Munitions designated for treatment in the MPF are transported to the MDF/BIF and placed on a conveyor. The munitions are then moved through an air lock into the Toxic Unpack Area. Leaking munitions and potentially leaking munitions can be safely unpacked in this area. The munitions then move down a conveyor gallery into the MDF for further processing by the MDM or BDS and ultimately into the MPF. This area is arranged similar the UPA described above with a personnel airlock, shower, and doffing room.

1.5.2.3 Explosive Containment Cubicle Nos. 1 and 2

1.5.2.3.1 Purpose

There are two ECCs: one adjacent to the DFS and one in the ETF. Munitions that contain explosive components are processed in the ECCs. The primary purpose of ECCs are to contain the fragments and chemical agents that would result from an explosive incident during the demilitarization of chemical munitions.

1.5.2.3.2 Description

Each ECC consists of a 2 ½-inch thick steel cylinder with an inside diameter of 10-feet and length of 24 ½- feet. The entrance end panel contains an inward-opening, hinged personnel door for passage of personnel. A smaller door within the personnel door and three small doors in the discharge end panel allow passage of munitions and ventilation air. The doors are remotely operated. A manually operated unlock mechanism allows the ECC personnel door to be opened by operators outside of the ECC in the event of a hydraulic system failure. The doors contain specially designed seals to prevent agent leakage during normal operations and to prevent massive leakage in case of an explosive incident. Chemical agent can be discharged through a pipe in the center of the ECC floor. Drawings that show the location and layout of these units are in Attachment 11.

The ECC is treated as a contaminated area during operations, requiring personnel to wear protective clothing when entering. No personnel are allowed in the ECC during operations. ECCs are located inside heated and ventilated housings.

A ventilation system maintains the ECC and the surrounding area under negative pressure in relation to atmospheric pressure. Ventilation air is pulled through activated carbon adsorption filters to remove chemical agent vapors.

#### 1.5.2.4 Equipment Test Facility

The ETF is a separate processing building that encloses the following process areas: ETF Vestibule, ETF UPA, ETF ECC No. 2 and ETF Repack Area. The ETF Vestibule is for controlled unpacking of leaking munitions under ventilated conditions. The ETF ECC No. 2 is identical in design to ECC No. 1 and is for processing munitions that contain explosive components. The ETF Repack Area is for repackaging non-contaminated munitions processed through ECC No. 2 for transportation to interim storage or to the MDF for ultimate disposal and agent destruction. Any munitions discovered to be contaminated are handled individually by over packing. Such items may be moved to the MDF for processing or to interim storage.

#### 1.5.2.5 Metal Parts Furnace and Pollution Abatement System

##### 1.5.2.5.1 Purpose

The MPF is used to thermally destroy residual agent from drained munitions without explosives. In addition, the MPF is used to destroy bulk agent. The MPF is also used for incinerating lab wastes, thermally decontaminating empty TCs, bombs, spray tank casings, projectiles, mines, and various scrap metal parts. The MPF may also be used to thermally treat spent carbon and filters from the ventilation systems, miscellaneous liquid wastes, solid laboratory wastes, wood, plastic, packing materials, and scrap metal. Treatment of a particular waste stream by incineration in the MPF may be performed after successful demonstration via a trial burn.

#### 1.5.2.6 Agent Collection and Transfer System

##### 1.5.2.6.1 Purpose

The Agent Collection and Transfer System is used to collect chemical agent from the munitions or bulk containers being processed and to transfer the agent to the feed tanks or to TCs for return to the depot stockpile.

##### 1.5.2.6.2 Collection Points

Agent is collected at three different process areas within CAMDS. They are: (1) the ECC No 1; (2) the Bulk Item Facility (BIF); and (3) the MDM processing area.

The pump suction in all three cases is provided by an air-operated diaphragm transfer pump controlled by the CMO.

##### 1.5.2.6.3 Description

The agent collection tanks are 2-feet 6-inches in diameter, 7-feet 10-inches high and are fabricated to rigid specifications. The tanks have a nominal capacity of 300 gallons.

The existing agent transfer lines inside ventilated areas are constructed of a corrosion resistant plastic lined piping system. The system uses schedule 10 pipe with a Teflon (TFE) liner. Joints and fittings are TFE lined, with either two bolt clamps or conventional bolted flanges. This type of piping system is located inside all toxic areas at CAMDS except the Segregator (SEG)/ECC No. 1 area. In the SEG/ECC No. 1 toxic area the agent piping system is constructed of schedule 80 steel pipe and plastic lined piping. Each agent piping system is leak tested before agent operations are started. The existing agent transfer lines inside toxic areas are constructed of 1-inch, schedule 80, seamless carbon steel pipe. Between the toxic areas, the agent transfer lines are of double wall construction. The double wall construction consists of 3-inch schedule 40 seamless carbon steel pipe outside, with the 1-inch schedule 80 pipe centered inside. Three spacers at equal distances around the circumference of the 1-inch pipe are used to maintain the center position. The annulus is maintained under negative pressure and is monitored for agent. The piping system within the MDF, BIF, and LIC is constructed of Resistoflex or equivalent TFE lined pipe with Serra-Seal connections, or steel pipe with welded connections.

#### 1.5.2.7 Liquid Waste Collection and Storage System

##### 1.5.2.7.1 Purpose

The purpose of the Liquid Waste Collection and Storage System is to collect liquid wastes, other than chemical agents, from areas where they are generated and transfer the liquid wastes to storage tanks for subsequent treatment in the MPF, Brine Dryers, or to an approved/permitted commercial treatment facility.

##### 1.5.2.7.2 Description

Liquid waste is collected from a large number of process areas within CAMDS. They are: (1) munition and bulk item processing areas (i.e., ECCs, BIF, and MDF); (2) incineration (MPF); (3) PAS (i.e., MPF); (4) personnel showers; (5) the CAMDS Laboratory; and (6) the Site Medical Facility (SMF).

Liquid waste is collected from a sump in each of these areas. If the liquid is PAS brine, it is sampled, certified to be less than Drinking Water Standards (DWS), and transferred to the brine holding tanks in the Brine Dryer Area (BDA) for treatment in the brine dryers. Sump liquids from toxic areas are pumped to the TMF tanks for incineration in a furnace.

The DFS and MPF/LIC PAS each have their own retention tanks where process PAS brines are sampled and certified prior to transfer to the brine holding tanks in the BDA.

There are five brine-holding tanks available in the BDA to accept the certified liquid wastes. Three of the tanks are 9-feet in diameter and 9-feet high with nominal capacity of 5,000 gallons each. The other two tanks are 13-feet in diameter and 14-feet high, and each has a nominal storage capacity of 15,000 gallons.

The tanks used for the Liquid Waste Collection and Storage System are installed in curbed, contained areas to prevent any liquid loss in the event of a tank leak. Detailed information on the liquid waste collection and storage system is found in Attachment 13.

1.5.2.8 Site Ventilation and Filter System

1.5.2.8.1 Purpose

The CAMDS ventilation and filter system continuously filters the air from agent-contaminated areas or work areas throughout the site. This is done both for personnel protection and to prevent release of agent vapors into non-agent (clean) areas or the atmosphere.

1.5.2.8.2 Description

The ventilation system consists of all of the ducts, dampers, controls, and filter units used to provide ventilation for Category A, B, C, and E areas throughout CAMDS. Category A areas have the greatest probability of contamination and are maintained at a pressure lower than that of adjacent areas that have a lower probability of contamination. This ensures airflow from the area of lesser contamination probability to the area of higher contamination probability. The criterion for air changes in Category A areas is a minimum of 20 air changes per hour, Category B areas is a minimum of 10 air changes per hour; and Category C areas is 6 air changes per hour (minimum). Category D is for areas at atmospheric pressure. A description of the site ventilation system is given in Attachment 18.

All Category A, B, and C areas are provided with an appropriate ventilation system to: (1) collect, filter, and exhaust agent vapors from the work area; (2) provide mixing of air that is essential for monitoring work areas with agent detection devices; and (3) provide a negative pressure within the work areas to eliminate escape of agent vapors to clean areas. The air is collected from these work areas and passed through filter units before being exhausted to the atmosphere.

Category E areas [i.e., SMF, CMO, and Demilitarization Protective Ensemble (DPE) dressing room] are maintained under positive pressure during alarm conditions by using a filter unit with carbon adsorption banks to clean the incoming air.

The filter system has several filter banks within each unit containing a filter train and a motor-driven centrifugal fan. The filter train includes: prefilters, high efficiency particulate air filters, multiple banks of activated carbon adsorption filters, and finally, a second bank of high efficiency particulate air filters. Air entry from any one area to an adjacent area is controlled through dampers. Ingress and egress from or between Category A and other areas are controlled by air locks and adequate interface airflow velocities. The ventilation system includes dampers to provide for the isolation of toxic areas in the event of loss of adequate airflow. The ventilation system runs continuously.

Differential pressure of at least 0.1-inch water column between separate category areas is maintained to avoid agent leakage into an area of lower contamination probability. Filter airflow, the negative manifold pressure, the negative pressure in each toxic area, and the pressure drop across each filter are monitored at the CM (Control Module), and the loss of either flow or negative pressure actuates an alarm. Ventilation is started prior to the introduction of toxic materials into any enclosure and continues until the enclosure is decontaminated and certified clean following toxic operations.

Prefilters and high efficiency particulate air (HEPA) filters are replaced when the pressure drop across the filters exceeds preestablished operational limits. Pressure drop is also visually indicated at the filter unit. The airflow alarm is automatic and indicates when airflow falls below the allowable range. Agent detectors are used between selected carbon filter banks. A filter unit may be shutdown and the carbon elements in a bank are subject to be changed if:

- The agent monitor between the carbon banks detects agent.
- The agent monitor in the exhaust stack from the filter detects agent.

Used prefilters, HEPA filters will be decontaminated on site and sent to a permitted commercial TSDF.

Carbon adsorption is the method for removing chemical agent vapors from contaminated air. Carbon has a high capacity to adsorb and retain the agent vapors.

A complete description of the filter systems at CAMDS is found in Attachment 18. The filter media are commercially available materials that have been designed, constructed, and tested in accordance with industrial standards for air purification systems.

#### 1.6 General Process Requirements Of Sub Part X Units

CAMDS treatment units are designed to test new and existing equipment, and new methods for demilitarizing different types of chemical munitions. Consequently, the modification process must be flexible enough to use different flow schemes and equipment to accomplish this goal.

Modifications to the current process flow schemes are expected to be made in developing these units. Some changes to the equipment are expected as improved treatment methods are developed. Systems to be developed and operated as Sub Part X Units are listed below. Complete descriptions of these units are found in Attachment 14.

- Brine Drum Dryers
- Brine Dryer Evaporator
- Rocket Shear Machine (RSM)
- Multipurpose Demilitarization Machine (MDM)
- Projectile Mortar Disassembly Machine (PMD)
- Bulk Drain Station

#### 1.7 Hazardous Waste Storage Areas

Hazardous wastes received and generated at CAMDS in support of test plans and projects are stored in the hazardous waste container storage areas listed below. These storage areas have been constructed to meet all environmental standards. Storage of waste is maintained at levels consistent with the test projects in progress at any time. As a project is completed, the wastes are collected and packaged appropriately, for proper storage and disposal.

##### 1.7.1 Hazardous Waste Container Storage Areas

Hazardous waste container storage areas at CAMDS are described in attachment 12. These areas, along with a brief description, are listed below:

- Equipment Test Facility
- Munitions Holding Area Igloo
- Metal Parts Furnace Area
- Residual Storage Area (RSA)
- Segregator/Explosive Containment Cubicle #1 Unpack Area
- Material Treatment Facility (MTF) Area
- Toxic Maintenance Facility
- Ventilated Storage Area (VSA)
- General Purpose Facility (GPF)
- Auxiliary Test Facility / Residual Storage Facility (ATF/RSF)
- Building 4104
- Building 4105
- Multipurpose Demilitarization Machine Processing Area and Conveyor Gallery (MDMCG)
- Multipurpose Demilitarization Facility (MDF) Toxic Unpack Area (MDF Toxic UPA)
- Bulk Item Facility Drain Bay (BIF)
- MDF/BIF Airlock
- MDF/BIF Loading Area

#### 1.7.2 Equipment Test Facility

The ETF building is located at the south end of CAMDS site. It is constructed with a reinforced concrete floor, steel panel walls, and roof. The building is heated and contains a fire sprinkler and fire deluge systems. The ETF storage area includes the UPA at the north end of the building and the Repack area at the south end of the building. The ETF also houses the ECC No. 2, which is located in the center of the building. Solid and liquid hazardous wastes are stored in the ETF.

#### 1.7.3 Munitions Holding Area Igloo

The MHA consists of an L-shaped, 15-foot high, double-riveted earthen and steel barricade and a storage igloo measuring approximately 25-feet long, 13-feet wide and 7-feet high (internal height). Munitions are transported to the MHA from storage locations in an ammunition van or flatbed truck for CAMDS site in-process storage.

#### 1.7.4 Metal Parts Furnace Area

The MPF storage area consists of a pad at the north end of the MPF building and an area in the northwest corner of the MPF building. A roll-up door separates the pad and the building. Overpacks or secondary containment drip pans are provided for any containers holding free liquid that are placed inside the MPF building. The base of the storage pad to the north provides secondary containment for containers of free liquid.

#### 1.7.5 Residual Storage Area

The RSA provides ventilated storage for items that have been used during various demilitarization testing at CAMDS. Material that has not been detoxified to a 3X level will be stored in the RSA. More detailed information regarding ventilated 3X storage areas can be found in Attachment 12. Final disposition of this waste will be either incineration, chemical decontamination, or disposal in a permitted Subtitle C Landfill. Miscellaneous liquid wastes may also be stored in the RSA prior to incineration or sent to a Subtitle C Landfill for treatment and disposal.

1.7.6 Segregator/Explosive Containment Cubicle No. 1 Unpack Area

The SEG/ECC No. 1 UPA is located north of the DFS building. It is constructed with a reinforced concrete floor, steel panel walls, and roof and has approximately 400 square feet of storage area. The building is heated and contains a fire sprinkler and fire deluge systems. This area stores solid and liquid waste.

1.7.7 Material Treatment Facility (MTF)

The MTF building is located at the north end of CAMDS site. It is constructed with a reinforced concrete floor, steel panel walls, and roof. The IMTF storage area includes the toxic area at the West Side of the building. The MTF houses the Material Decontamination Chamber 2, unit A (MDC 2, unit A). The MTF stores solid and liquid hazardous waste.

1.7.8 Toxic Maintenance Facility

The TMF building is located at the north end of the CAMDS site. It is constructed with a reinforced concrete floor, steel panel walls, and roof. The TMF stores solid and liquid hazardous waste.

1.7.9 Ventilated Storage Area

The VSA is located immediately south of the ATF in the southeast corner of the CAMDS facility. It provides ventilated storage for waste items that have been generated from testing and processing of agent wastes. Examples of the types of wastes stored in the VSA are agent processing wastes, spent carbon and non-carbon filters, and potentially contaminated PPE items, liquid and solid laboratory wastes, and maintenance residues. The waste items will be stored in the contaminated area of the VSA, prior to final treatment or disposal. The VSA also houses the Material Decontamination Chamber 2, unit B (MDC 2, unit B). More detailed information regarding ventilated storage areas can be found in Attachment 12.

1.7.10 Auxiliary Test Facility / Residual Storage Facility

The ATF/RSF building is located at the south end of the CAMDS site. It is constructed with a reinforced concrete floor, steel panel walls, and roof. The ATF/RSF will store solid and liquid hazardous waste.

1.7.11 General Purpose Facility

The GPF is located immediately north of the ATF in the southeast corner of the CAMDS facility. It provides ventilated storage for waste items that have been generated from testing and processing of agent wastes. Examples of the types of wastes stored in the GPF are agent processing wastes, spent carbon and non carbon filters, potentially contaminated PPE items, liquid and solid laboratory wastes, and maintenance residues. The waste items will be stored in the containment area of the GPF, prior to final treatment or disposal. More detailed information regarding ventilated storage areas can be found in Attachment 12.

1.7.12 Multipurpose Demilitarization Machine Processing Area and Conveyor Gallery (MDMCG)

The MDM/CG is located in the East End of the Multipurpose Demilitarization Facility (MDF), which is located north of and contiguous to the Metal Parts Furnace (MPF) building. The MDM Processing Area is a toxic enclosure in the Multipurpose Demilitarization Facility (MDF). It is constructed of reinforced concrete floors, steel wall panels, and roof. The MDM/CG will be used to store containerized liquid waste.

1.7.13 Multipurpose Demilitarization Facility (MDF) Toxic Unpack Area (MDF Toxic UPA)

The MDM Toxic UPA is located in the East End of the MDF, which is located north and contiguous to the MPF Building. The MPF Toxic Unpack is a toxic enclosure in the MDF. It is constructed of reinforced concrete floors, steel wall panels, and roof. The MDF Toxic Unpack Area will be used to store containerized liquid waste.

1.7.14 Bulk Item Facility Drain Bay (BIF)

The BIF is located on the East End of the MDF, which is located north of and contiguous to the MPF Building. The MDM Processing Area is a toxic enclosure in the MDF. It is constructed of reinforced concrete floors, steel wall panels, and roof. The BIF will be used to store containerized liquid waste.

1.7.15 MDF/BIF Airlock

The MDF/BIF Airlock is located in the West End of the MDF, which is located north of and contiguous to the MPF Building. The MDF/BIF Airlock is a toxic enclosure in the MDF. It is constructed of reinforced concrete floors, steel wall panels, and roof. The MDF/BIF Airlock will be used to store containerized liquid wastes.

1.7.16 MDF/BIF Loading Area

The MDF/BIF Loading Area is located in the West End of the MDF, which is located north of and contiguous to the MPF Building. The MDF/BIF Loading Area is an enclosed, non-ventilated area in the MDF. It is constructed of reinforced concrete floors, steel wall panels, and roof. The MDF/BIF Loading Area will be used to store containerized liquid wastes.

1.7.17 Building 4104

Building 4104 is used to store wastes generated from the operation and maintenance of the facilities at DCD. The building is also used to store components of process equipment that are removed from CAMDS, but will be used again. All items (wastes and stored equipment) stored in Building 4104 have a minimum decontamination designation of 3X. Solid and liquid wastes are stored at this location.

1.7.18 Building 4105

Building 4105 is identical in design to Building 4104 and is also used to store wastes generated from the operation and maintenance of the facilities at DCD. All items (wastes and stored equipment) stored in this building have a minimum decontamination designation of 3X. Only hazardous wastes that do not contain free liquids are stored in Building 4105.

1.8 Tank Storage Areas

Hazardous wastes received and generated at CAMDS in support of test plans and projects are stored in the agent tanks listed below. These storage tanks have been constructed to meet all environmental tank standards. Storage of waste is maintained at levels consistent with the test projects in progress at any time. As a project is completed, the wastes are collected and packaged appropriately, for proper storage and disposal.

There are several hazardous waste tank systems necessary for CAMDS. These systems vary and consist of any or all of the following: tanks, sumps, pumps, and other ancillary equipment. There are tank systems to collect agent, other liquid wastes, and laboratory wastes. A presentation of specific information pertaining to CAMDS tank systems is provided in Attachment 13.

Hazardous wastes stored in tanks at CAMDS are stored in the following tanks.

1.8.1 Agent Tanks:

- Segregation Area - Tank 1
- Segregation Area - Tank 2
- Multipurpose Demilitarization Facility - Tank 3
- Multipurpose Demilitarization Facility - Tank 4
- Liquid Incinerator Room - Tank 5
- Agent Storage Room - Tank 6
- Agent Storage Room - Tank 7

1.8.2 Brine Drying Area Brine Holding Tanks and Equipment:

- Brine Drying Area - Tank 13A
- Brine Drying Area - Tank 13B
- Brine Drying Area - Tank 13C
- Brine Drying Area - Tank 13D
- Brine Drying Area - Tank 13E

1.8.3 Toxic Maintenance Facility Liquid Waste Storage Tanks:

- Toxic Maintenance Facility - Tank 1
- Toxic Maintenance Facility - Tank 2

#### 1.9 Sump/Collection Areas

Waste liquid is collected into sumps in each area of the CAMDS site. If the waste liquid is to be incinerated, it is pumped to the waste liquid storage tanks in the TMF.

Sumps at CAMDS provide waste collection and secondary containment for hazardous waste management units. They are listed in Attachment 13, Table 13-2.

#### 1.10 Traffic Pattern

The U.S. Army Chemical Agent Munitions Disposal System (CAMDS) is located in the high security area of the Tooele Army Depot South Area Complex. This area is inside the toxic limited area and, as such, only vehicles whose drivers have been authorized by both depot security and chemical surety are allowed within the compound. The speeds inside the CAMDS toxic limited area are confined to walking speed; no stop signs are posted, nor are they required.

Munitions are transferred from Munitions Holding Area (MHA) to the to the Unpack Area (UPA) by forklift, escorted by a pedestrian who watches for obstacles or other traffic. During this transfer, the Public Address System is used to inform all personnel that a toxic move is in progress and that all personnel and vehicles are to stay clear of this route.

Truck traffic at CAMDS is necessary to support the mission. The test officer coordinates this traffic so that there are no conflicts between the movement of munitions and other traffic.

The roadways at CAMDS are a typical 3-inch asphalt pavement over a 6-inch base of gravel. This roadway conforms to the requirements of the American Association of State Highway officials for loading. Commercial truck traffic approved for transportation on state highways has had no difficulty operating on the CAMDS roadway system.

Traffic patterns at CAMDS are shown in drawing TCDS 40-102-01. Frequencies of various vehicle types are shown in this drawing as well.

#### 1.11 Facility Location Information

##### 1.11.1 Facility location

The U.S. Army Chemical Agent Munitions Disposal System (CAMDS) facility is located in the southwest quadrant of Deseret Chemical Depot (DCD). This depot area is located in Tooele County, Utah, approximately 25 miles south of The Great Salt Lake in Rush Valley.

The Rush Valley fill material consists of alluvial deposits that resulted from erosion of the adjoining mountain ranges and deposition onto the valley floor. The depths of fill material range from 300 to 400 feet on the eastern side, but may exceed depths greater

than 1000 feet on the western side of the valley. The fill consists primarily Tertiary age alluvial deposits, which have been named the Salt Lake group. The Salt Lake group deposits are primarily comprised of unconsolidated to moderately consolidated alluvial sand and gravels, and playa lake silts and clays. The deposits generally grade from predominantly fine to coarse-grained sediments from the valley center to the valley margins. Overlying and coalescing with the Salt Lake Group deposits are massive Quaternary alluvial fans on which the CAMDS facility is located.

1.11.2 Seismic standards

Deseret Chemical Depot, is an existing facility and, as such, is exempt from the provisions of seismic location standards.

1.11.3 100-year flood plain standards

The CAMDS operation and the DCD are not subject to flooding, based on the following facts:

- The overall drainage gradient for the entire facility is 1 percent or greater.
- No channels exist that would concentrate flows from off-site up gradient areas.
- Few well-defined natural drainage channels exist in the DCD vicinity; there are none that would carry or direct water to or through any of the hazardous waste management units.
- There are no on-site barriers to impede runoff. No significant vegetation exists to retain runoff waters.
- The area is arid to semi-arid, and receives little precipitation. The 100-year 24-hour precipitation event is less than 3.2 inches.
- The soils of the area are generally very pervious, so there is little runoff.